第10講　三角比の拡張

PART1　座標を用いた三角比の定義

例題

次の三角比の値を求めよ。

(1)　$\sin 120^\circ$，$\cos 120^\circ$，$\tan 120^\circ$

(2)　$\sin 135^\circ$，$\cos 135^\circ$，$\tan 135^\circ$

(3)　$\sin 150^\circ$，$\cos 150^\circ$，$\tan 150^\circ$

Point Pickup

練習

下の表の空欄にあてはまる値を入れ，表を完成させよ。

θ	$0°$	$30°$	$45°$	$60°$	$90°$	$120°$	$135°$	$150°$	$180°$
$\sin\theta$									
$\cos\theta$									
$\tan\theta$					／				

第10講　PART1　確認問題

次の三角比の値を求め，①～⑨のうちから選べ。

1 $\sin 45^\circ =$ ア ，$\cos 45^\circ =$ イ ，$\tan 45^\circ =$ ウ

① $\frac{1}{2}$　② $\frac{1}{\sqrt{2}}$　③ $\frac{\sqrt{3}}{2}$　④ 1　⑤ $\sqrt{2}$

⑥ $-\frac{1}{2}$　⑦ $-\frac{1}{\sqrt{2}}$　⑧ $-\frac{\sqrt{3}}{2}$　⑨ -1

2 $\sin 120^\circ =$ エ ，$\cos 120^\circ =$ オ ，$\tan 120^\circ =$ カ

① $\frac{1}{2}$　② $\frac{\sqrt{3}}{2}$　③ $\frac{1}{\sqrt{3}}$　④ $\sqrt{3}$　⑤ 0

⑥ $-\frac{1}{2}$　⑦ $-\frac{\sqrt{3}}{2}$　⑧ $-\frac{1}{\sqrt{3}}$　⑨ $-\sqrt{3}$

3 $\sin 180^\circ =$ キ ，$\cos 180^\circ =$ ク ，$\tan 180^\circ =$ ケ

① $\frac{1}{2}$　② $\frac{1}{\sqrt{2}}$　③ $\frac{\sqrt{3}}{2}$　④ 1　⑤ 0

⑥ $-\frac{1}{2}$　⑦ $-\frac{1}{\sqrt{2}}$　⑧ $-\frac{\sqrt{3}}{2}$　⑨ -1

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次の三角比の値を求めよ。

(1)　$\sin 120^\circ$，$\cos 120^\circ$，$\tan 120^\circ$

(2)　$\sin 135^\circ$，$\cos 135^\circ$，$\tan 135^\circ$

(3)　$\sin 150^\circ$，$\cos 150^\circ$，$\tan 150^\circ$

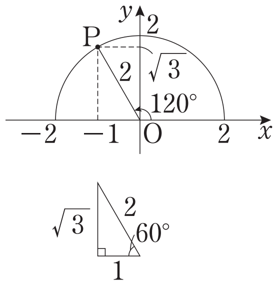
(1)　$\sin 120^\circ = \dfrac{\sqrt{3}}{2}$，$\cos 120^\circ = \dfrac{-1}{2} = -\dfrac{1}{2}$，$\tan 120^\circ = \dfrac{\sqrt{3}}{-1} = -\sqrt{3}$

(2)　$\sin 135^\circ = \dfrac{1}{\sqrt{2}}$，$\cos 135^\circ = \dfrac{-1}{\sqrt{2}} = -\dfrac{1}{\sqrt{2}}$，$\tan 135^\circ = \dfrac{1}{-1} = -1$

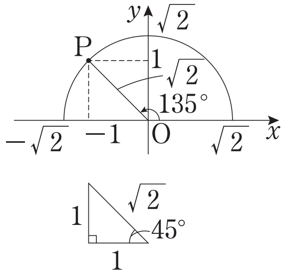
(3)　$\sin 150^\circ = \dfrac{1}{2}$，$\cos 150^\circ = \dfrac{-\sqrt{3}}{2} = -\dfrac{\sqrt{3}}{2}$，$\tan 150^\circ = \dfrac{1}{-\sqrt{3}} = -\dfrac{1}{\sqrt{3}}$

（参考図）

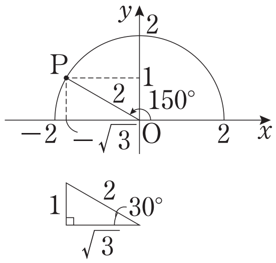
(1)



(2)



(3)



練習

下の表の空欄にあてはまる値を入れ，表を完成させよ。

θ	0°	30°	45°	60°	90°	120°	135°	150°	180°
$\sin\theta$									
$\cos\theta$									
$\tan\theta$					／				

θ	0°	30°	45°	60°	90°	120°	135°	150°	180°
$\sin\theta$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\cos\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	$-\frac{\sqrt{3}}{2}$	-1
$\tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$		$-\sqrt{3}$	-1	$-\frac{1}{\sqrt{3}}$	0

第 10 講　PART1　確認問題 解答

1

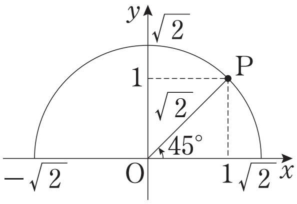
[正解] ア：②，イ：②，ウ：④

[解説]

$\sin 45^\circ = \dfrac{1}{\sqrt{2}}$ [A]

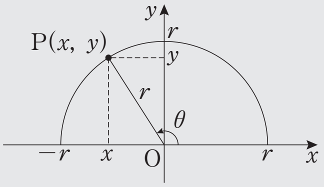
$\cos 45^\circ = \dfrac{1}{\sqrt{2}}$

$\tan 45^\circ = \dfrac{1}{1} = 1$



[A]　$0^\circ \leqq \theta \leqq 180^\circ$ のとき

$\sin\theta = \dfrac{y}{r}$，$\cos\theta = \dfrac{x}{r}$，$\tan\theta = \dfrac{y}{x}$



2

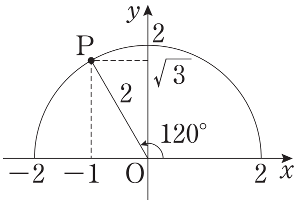
[正解] エ：②，オ：⑥，カ：⑨

[解説]

$\sin 120^\circ = \dfrac{\sqrt{3}}{2}$ [B]

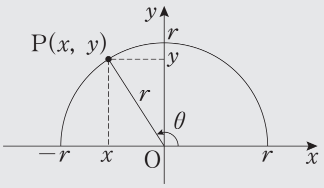
$\cos 120^\circ = \dfrac{-1}{2} = -\dfrac{1}{2}$

$\tan 120^\circ = \dfrac{\sqrt{3}}{-1} = -\sqrt{3}$



[B]　$0^\circ \leqq \theta \leqq 180^\circ$ のとき

$\sin\theta = \dfrac{y}{r}$，$\cos\theta = \dfrac{x}{r}$，$\tan\theta = \dfrac{y}{x}$



3

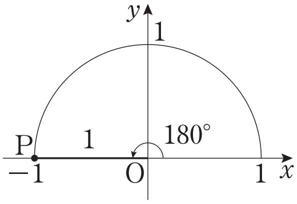
[正解] キ：⑤，ク：⑨，ケ：⑤

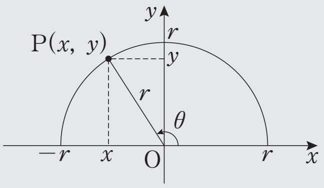
[解説]

$\sin 180^\circ = \dfrac{0}{1} = 0$ [C]

$\cos 180^\circ = \dfrac{-1}{1} = -1$

$\tan 180^\circ = \dfrac{0}{-1} = 0$



[C]　$0^\circ \leqq \theta \leqq 180^\circ$ のとき

$\sin\theta = \dfrac{y}{r}$，$\cos\theta = \dfrac{x}{r}$，$\tan\theta = \dfrac{y}{x}$